								Signs of	Failure to				Rosamma
Trench Overall score Unit (0,1, or 2)	Box Plots Q-Q Plots  1) K-40 has some negative results	Rounds excavat	I Gamma scan or static concerns	On vs offsite lab Time Series	Suspect name (1=yes, 0=no)	Name, if suspect	Name, if not suspect	falsifying	Signs of falsification summary  1) No Confirmatory/biased samples were collected with FSS  2) Off-site lab mass not reported		Comments - Other  1) Significant data quality problems, indicated by the following:	Followup needed, e.g. questions for Navy	See additional EPA nd for statistical analysis PCA (1 or 0)
TU001 2	Cs-137 results all low, with multiple negative results - indicating a data quality issue  2) FSS data sets for Ac-228, Bi-214 40 indicate at least two different slope, Cs-137 negative results - 2) presults all low, with multiple negative results - indicating a data quality issue 40 indicate at least two different slope, Cs-137 negative results - 2) presults all low, with multiple negative results - indicating a data quality issue	esults ·, and K·	2) Names of samplers/surveyors not provided in SUPR 3) 34 investigative samples are not in the SUPR or RACR	Onsite lab results biased high compared to offsite  1 FSS Bi-214 and 1 Ac-228 result at or below 0, 3 FSS K-40, several Cs-137 results below 0		Name(s) not provided	Name(s) not provided		3) Investigative data, and scan and static data not provided in RACR or SUPR  4) Names of samplers/surveyors not provided in the SUPR  5) K-40 and Cs-137 had the lowest mean results of any TU in Parcels B & D-2  6) Q Q Plots for FSS results for Ac-228, Bi-214, and K-40 depict at leat two different data populations	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  3) 34 investigative samples are not in the SUPR or RACR	K-40 and Cs-137 had the lowest mean results of any TU in Parcels B & D-2  Multiple Cs-137 results at or below 0  2) TU contined sewer line that was connected to or downstream from radiologically impacted building 157		0
TU002 2	Cs-137 results all low, with multiple negative results - indicating a data quality issue  Ac-228, Bi-214, K-40 RAS and K-4 Bias results have a different slope FSS		1) Gamma static and scan results were not provided in the SUPR  2) Names of samplers/surveyors not provided in SUPR	Onsite Ra-226 resuts high compared to offsite  1 FSS Bi-214, 3 FSS Ac-228, several Characterization and Bias, several CS-137 results below 0.		Name(s) not provided	Name(s) not provided		1) Scan and static data not provided in RACR or SUPR  2) Names of samplers/surveyors not provided in the SUPR  3) K-40 had second lowest mean results of any TU in Parcels B & D-2  4) Q Q Plots for FSS results for Bi-214 depict at leat two different data populations  1) Scan and static data not provided in RACR or SUPR	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  1) Gamma static and scan results were not provided in	1) Significant data quality problems, indicated by the following:  K-40 had second lowest mean results of any TU in Parcels B & D-2  Multiple Cs-137 results at or below 0  2) TU contined sewer line that was connected to or downstream from radiologically impacted building 157		0
TU003 2	Cs-137 results all low, with multiple negative results - indicating a data quality issue  K-40 FSS has a different slope than radionulides FSS (includes negative results - values)	tive 1	1) Gamma static and scan results were not provided in the SUPR  2) Names of samplers/surveyors not provided in SUPR	Inconsistent - offsite lab reported non- detects for sample 1 and 5 for Ac-228; onsite lab reported results at 0.616 pCi/g and 0.215 pCi/g respectively.	0.5	Name(s) not provided	Name(s) not provided	1	2) Names of samplers/surveyors not provided in the SUPR  3) 16 of 18 FSS sample results for Cs-137 were less than zero.  1) No Confirmatory/biased samples were collected with FSS	the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  1) Gamma static and scan results were not provided in	<ul> <li>1) Significant data quality problems, indicated by the following:         Multiple Cs-137 results at or below 0     </li> <li>2) TU contined sewer line that was connected to or downstream from radiologically impacted building 140</li> </ul>		0
TU004 2	other radionulides FSS (includes not results - values)  indicating a data quality issue  2) FSS results for indicate two diffusions for Ac-228	egative 1	1) Gamma static and scan results were not provided in the SUPR  2) 67 investigative samples results were not in the SUPR or RACR  3) Names of samplers/surveyors not provided in SUPR	Inconsistent - offsite lab data reported at levels lower than data reported form onsite lab.  1 Bi-214 FSS, 3 Ac-228 FSS, and 3 K-40 FSS results below 0. Several Cs-137 results below 0.		Name(s) not provided	Name(s) not provided		2) Investigative data, and scan and static data not provided in RACR or SUPR  3) Names of samplers/surveyors not provided in the SUPR  4) Q Q Plots for FSS results depict at leat two different data populations for Ac-228.  1) Two Bi-214 FSS results elevated compared to Ra-226 result reported.	the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  1) Gamma static and scan results were not provided in	1) Significant data quality problems, indicated by the following:  Multiple Cs-137 results at or below 0  2) TU contined sewer line that was connected to or downstream from radiologically impacted buildings 140 and 142  1) Significant data quality problems, indicated by the following:		0
TU005 2	K-40 in FSS appears to be from a different population than all other surveys.  Cs-137 results all low, with multiple negative results - indicating a data quality issue	t two 2	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  3) Names of samplers/surveyors not provided in SUPR	Inconsistent - two elevated FSS results for Bi-214 are not comparable to Ra-226 reported results.  Two Bi-214 FSS results elevated compared to Ra-226 result reported.	0.5	Name(s) not provided	Name(s) not provided	1	2) Scan and static data not provided in RACR or SUPR  1  3) Names of samplers/surveyors not provided in the SUPR  4) FSS results indicate at least two populations are present in Bi-214 data set.	the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR	Multiple Cs-137 results at or below 0  2) Offsite lab mass not reported for 6PBFS-005-115  3) Two FSS samples have high Bi-214 outliers.  1) Mass of sample reported by onsite is the same as the offsite lab for samples 030 and 017 (reported on 12/5/2006); offiste lab mass not reported for sample 010, which was reported on 7/23/2009.		0
TU006 2	Cs-137 results all low, with multiple negative results - indicating a data quality issue  K-40 FSS has a different slope than radionulides FSS (includes negative results - values)  Large range of K-40 results	tive 2	<ol> <li>Gamma static and scan results were not provided in the SUPR</li> <li>Gamma static and scan surveyor is not listed in the SUPR</li> <li>Names of samplers/surveyors not provided in SUPR</li> <li>One Bi-214 result in FSS reported at 0.</li> </ol>	Inconsistencies noted Inconsistencies noted	0.5	Name(s) not provided	Name(s) not provided	1	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  3) Names of samplers/surveyors not provided in SUPR  4) One Bi-214 result in FSS reported at 0.	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR	2) No confirmatory/biased samples collected for FSS  3) One Bi-214in FSS was below zero.  4) Large range of K-40 values (2.778 - 19.527 pCi/g)  5) High static count recorded at 9,132 cpm compared to surrounding TUs. Offsite samples from Eberline Services are		0
			5) Pb-212 results were higher for TU006 than the average for Parcels B and D-2.						<ol> <li>Pb-212 results were higher for TU006 than the average for Parcels b and D-2.</li> <li>Differences in recorded collection date for sample 10; reported sample masses were different with the offiste lab reording an unusually low mass. It appears the onsite and offsite lab did not analyze the same sample.</li> </ol>		inconsistent with Ac-228 data from all TUs.  6) Pb-212 results were higher for TU006 than the average for Parcels B and D-2.		
	Cs-137 results all low, with multiple negative results -     indicating a data quality issue		<ol> <li>Gamma static and scan results were not provided in the SUPR</li> <li>Gamma static and scan surveyor is not listed in the SUPR</li> <li>Names of samplers/surveyors not provided in SUPR</li> </ol>	Inconsistent - sample 10 had a collection date, and reported sample masses were different between onsite and offsite lab. It appears the onsite and offsite labs did not count the					2) Delayed counting os samples of four days after collection. One sample was recounted in 2010 as part of a quality review.  3) Scan/Static Surveyor associated with falsification at other locations at HPNS  4) Inconsistent - sample 10 had a collection date, and reported sample masses were different between onsite and offsite lab. It appears the onsite and offsite labs did not	Gamma static and scan results were not provided in the SUPR	1) Scan and static data not provided in RACR or SUPR  2) Names of samplers/surveyors not provided in the SUPR		
TU007 2	2) One outlier for Bi-214 and Ac-228, three outliers for K- 40 identified.  3) Three FSS samples have unusually small variance	1	4) TU007 has the highest static count of 9,132 cpm compared to surrounding TUs. No signature form the site RSO was recorded.	different between onsite and offsite lab. It appears the onsite and offsite labs did not count the same sample.  Delayed counting of samples (4 days). One sample was recounted in 2010 as part of a quality review.		J. Cunningham	Name(s) not provided	1	count the same sample.  5) Delayed counting of samples (4 days). One sample was recounted in 2010 as part of a quality review.  6) Several Ac-228 resuts at or below 0; outliers identified for Ac-228, Bi-214, K-40 indicating potential data quality issues and/or falsification	2) Gamma static and scan surveyor is not listed in the SUPR	3) 16 of 18 FSS sample results for Cs-137 were less than zero.		
			Gamma static and scan results were not provided in the SUPR	Seven final systematic samples have results at 0 based on offsite lab results.  Low values for Ac-228, Bi-214, and K-				7	7) Highest count recorded was 9,132 cpm for location 004. no Signature from site RSO was recorded.  8) No confirmation/bias samples collected  1) Scan and static data not provided in RACR or SUPR	Gamma static and scan results were not provided in			
TU008 2	Ac-228 and Cs-137 results low, with multiple negative results - indicating a data quality issue  K-40 FSS has a different slope than radionulides FSS (includes negative values)		2) Gamma static and scan surveyor is not listed in the SUPR  3) Names of samplers/surveyors not provided in SUPR	This is inconsistent with onsite.  Low activites reported in samples 002, 007, 011, 012, 103; seven FSS samples have results at 0 based on offsite lab results.  Low values 101 Ac-228, Bi-214, and K-40 on the same day.  The K-40 data range large: from 1.03 through 18.74 pCi/g.		Name(s) not provided	Name(s) not provided		2) Names of samplers/surveyors not provided in the SUPR  1 3) Seven FSS samples have results at 0 based on offsite lab results.; eight samples have low activities when compared to TU009.	the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR	1) Significant data quality problems, indicated by the following:  Multiple Cs-137 results at or below 0  2) TU contined sewer line that was connected to or downstream from radiologically impacted buildings 140 and 130		0
TU009 2	Ac-228 and Cs-137 results low, with multiple negative results - indicating a data quality issue  K-40 FSS has a different slope than radionulides FSS (includes negative values)		1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  3) Names of samplers/surveyors not provided in SUPR	1 Bi-214 FSS sampe, 3 Ac-228 FSS samples and 1 K-40 FSS results below 0. 2 offsite (Eberline) FSS results at 0. K-40 range is large (-0.905 0 16.84 pCi/g).		Name(s) not provided	Name(s) not provided	1	1) Scan and static data not provided in RACR or SUPR  2) Names of samplers/surveyors not provided in the SUPR  1	Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  SUPR	1) Significant data quality problems, indicated by the following:  Multiple Cs-137 results at or below 0  2) TU contined sewer line that was connected to or downstream from radiologically impacted buildings 140 and 130		0
TU010 2	Cs-137 results all low, with multiple negative results - indicating a data quality issue	5	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  3) Names of samplers/surveyors not provided in SUPR	Failrly consistent None	0		C. Fluty	1	RSO Signature missing from Gamma Static and Scan Data.  1 2) All samples analyzed in June 2007 except for one analyzed on October 8, 2010	<ol> <li>RSO Signature missing from Gamma Static and Scan Data.</li> <li>All samples analyzed in June 2007 except for one analyzed on October 8, 2010</li> </ol>	1) Sample mass not reported for offsite lab analysis  2) samples collected on 26 different days	Can the Navy provide an explanation for why sample data would be reported in June 2007 but then one result would be analyzed and reported over three years later in 2010?	(samples collected on 26 different days)
TU011 2	Cs-137 results all low, with multiple negative results - indicating a data quality issue  K-40 FSS has a different slope than radionulides FSS (includes negative results - values)		1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  3) Names of samplers/surveyors not provided in SUPR	Offsite and Onsite data within 1 order of magnitude  None noted.	0.5	Name(s) not provided	Name(s) not provided	1	1) Scan and static data not provided in RACR or SUPR  2) Names of samplers/surveyors not provided in the SUPR  1	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  SUPR			0
TU012 2	Cs-137 results all low, with multiple negative results - indicating a data quality issue radionulides FSS	o other 1	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  3) Names of samplers/surveyors not provided in SUPR	Acceptable comparble data sets  Neither Eberline nor TestAmerica reported the sample mass  Ac-228 and Pb-214 have low means, 1 negatvie result is reported for Bi-214, Ac-228, and K040.		Name(s) not provided	Name(s) not provided		1) Scan and static data not provided in RACR or SUPR  2) Names of samplers/surveyors not provided in the SUPR  1	Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  SUPR		1) Item 4 on the Data EvalForm states	0
TU013 2	Bi-214 and K-40 RAS results look like they are from a different population than other surveys Cs-137 results all low, with multiple negative results - indicating a data quality issue	,	1) Names of samplers/surveyors not provided in SUPR	Results between offsite and onstie lab compare within 1 order of magnitude (10X).	0	Name(s) not provided	J. Rosenhagen	1	1) Box Pots and QQ plots of RAS results for Ac-228, Bi-214, and K-40 appear to be from a different population than other surveys  2) Th-232 decay chain radionuclides are not in equilibrium in the FSS.  3) The Data Eval Form states in Section 4 "Gamma static counts ranged between 4960 and 5536, an unusually narrow range for heterogeneous material. However, the gamma static counts are consistent with the gamma scan range, but are not consistent with the	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR	<ol> <li>FSS Results for the thorium series included two negative Ac-228 results, Bi-212 at 0.47 pCi/g, and Tl-208 at 0. These concentrations do not indicate that the Th-232 decay chain is in equilibrium as would be expected for native soils. This dat indicates there are data quality issues, and may also be associated with falsification of results.</li> <li>Sample 6PBFS-013-29 counted onsite on 10/02/06, and recounted about 2 years later on 12/01/08 by offsite lab.</li> </ol>	Please explain.  2) Sample 6PBFS-013-29 counted	0
TU014 2	1) Ac-228, Bi-214, and K-40 all have extremely low variance in the FSS results. Potentially indicates falsification  Negative results reported for Ac-22 Bi-214 RAS survey, altering the slow variance in populations can not	pe so 4	1) Gamma static and scan results were not provided in the SUPR.  2) Gamma static and scan surveyor is not listed in the SUPR	The Data Eval form states "Onsite / offsite data is satisfatorily comparable (within a factor of 10x)."  1 Bi-214 FSS result below 0.	0.5	Name(s) not provided	Name(s) not provided	1	analytical results of the FSS dataset." The inconsistencies in the pattern of data ranges and lack of comporable results indicates falsification most likely occurred.  1) Ac-228, Bi-214, and K-40 all have extremely low variance in the FSS results. The unusual small variance in results can not be explained by any reasonable argument, threfore the reviwer believes this is an indication of falsification  2) Missing scan and static data in SUPR, in addition to the noted lack of normal variability in the FSS results for Ac-228, Bi-214, and K-40 indicate the data may have	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR	3) Fss-SYS, FSS-BIAS and RAS samples all collected on 9/25/2006  This TU014 was located downstream and/or was connected to a radiologically-impacted building (Bldg. 114), indicating a higher liklihood that the Sewer lines and trench were radiologically contaminated.	onsite on 10/02/06, and recounted about 2 years later on 12/01/08 by offsite lab.	0
	2) Cs-137 results all low, with multiple negative results -     indicating a data quality issue  Cs. 127 results all low, with multiple negative results.		3) Names of samplers/surveyors not provided in SUPR	The Data Eval Form Section 3 (Bi-214) states "One sample seems to be					been falsified. Additionally, TU014 underwent at least four excavations. The need to perform multiple excavations and sampling may have provided a motive for falsifying results.  1) The Data Eval Form states "The comparison results for samples (110 and 124) were not equivalent for K-40, Ac-228, and Bi-214."  2) FSS samples (111 through 115, 117 through 124 and 127) were counted on	3) No FSS Bias samples collected	1) The Data Eval Form 'Summany of Eindings' Summany of Eindings states "The mean results for Bi 212. Bb 212, and As 229		
TU015 1	Cs-137 results all low, with multiple negative results - indicating a data quality issue  None noted	2	1) Gamma static and scan results were not signed by the RSO	results for samples (110 and 124) were not equivalent for K-40, Ac-228, and Bi-214."  inconsistent with the overall data population. Sample 119 has a result below 0. Two samples 110 and 113 were the highest at 1.479 and 1.455 pCi/g, respectively."	0	Name(s) not provided	P. Vigil	1	1/7/2007. Sample 125 was counted on 9/10/2010. Only samples 110, 116, and 126 were counted within 2 working days on 12/21/2006. The Christmas and New Year's holidays occurred during this period.  3) Scan and Static Survey data did not have the RSO signature.  4) Worker suspected of falsifying results contducted the gamma surveys at this TU.	1) Scan and static measurment data did not contain the RSO signature.	<ol> <li>The Data Eval Form 'Summary of Findings' Summary of Findings states "The mean results for Bi-212, Pb-212, and Ac-228 were all higher than average for Parcel B" The Bi-214 and Pb-214 mean results were also higher than average for Parcel B"</li> <li>One Bi-214 result was negative and offsite and onsite analyses of samples 110 and 124 are not consistent.</li> </ol>		0
TU016 2	1) Data Eval Form states "Notes: Final systematic samples within the normal distribution. One outlier was identified for Ac-228."  3) Cs-137 results all low, with multiple negative results - indicating a data quality issue  Ac-228, Bi-214, K-40, Cs-137 FSS sets have some negative results indicating data quality issue	ts, 1	<ol> <li>Gamma static and scan results were not provided in the SUPR</li> <li>Gamma static and scan surveyor is not listed in the SUPR</li> <li>Names of samplers/surveyors not provided in SUPR</li> </ol>	The data are not consistent for Ac-228 and K-40; the offsite lab results included zero values for Ac-228.  1 Ac-228 FSS result is below 0, K-40 range large (5.28 - 21.18 pCi/g).	0.5	Name(s) not provided	Name(s) not provided	1	1) Missing scan and static data and signature of surveyers or samples missing  2) Inconsistency bewteen offsite and onsite lab results between onsite and offsite lab, large range of K-40 values  3) Long time interval between when samples 066, 068, 073, and 078 were collected (2006) and analyzed (9/13/10). Data Eval Form states "FSS samples (066, 068, 073, and 078) were analyzed on 9/13/2010. The sample collection date was on 12/28/2006.	1) Gamma static and scan results were not provided in the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR  3) Names of surveyors/samplers not provided in SUPRs			0
				The Data Evaluation Form states "The					1) Logic Test 4 states FSS samples 072, 076, 077, 079, 080, and 081 analyzed within 2 working days. FSS samples 064, 065, 070, and 075 were analyzed on 12/1/2006. FSS samples 067, 069, 073, and 078 were analyzed on 9/13/2010. The analysis of samples over 3 years later is suspicious.			1. Section 4 states "The static survey was dated 11/28/2007. The survey date seems to be a mistake. The FSS samples were collected on 11/28/2006. The static survey was approved on 3/6/2008 as indicated in Attachment 1 of the SUPR document. The highest ount was recorded at 6.126 cpm for sample	
TU017 2	Cs-137 results all low, with multiple negative results - indicating a data quality issue	1	1) "The static survey was dated 11/28/2007. The survey date seems to be a mistake. The FSS samples were collected on 11/28/2006. The static survey was approved on 3/6/2008 as indicated in Attachment 1 of the SUPR document. The highest count was recorded at 6.126 cpm for sample location 081. No signature from the site RSO was recorded on this survey."	the offsite lab is not evidence of potential data falsification by theonsite staff." The	0.5	Name(s) not provided	Name(s) not provided		<ul> <li>2) The approval data for the Static Survey of 3/6/2008 pre-dates when the Static Survey was conducted on 11/28/2006. The Data Evaluation Form states "The survey date seems to be a mistake." However, the reviewer notes that the difference in dates is unusual and can not be dismissed under an assumption that this was a mistake.</li> <li>3) The Data Evaluation Form states "The scan survey was performed on 11/28/2007. The survey date seems to be a mistake. The FSS samples were collected on 11/28/2006". The reviewer notes that given the fact that the scan, static, and FSS survey/sample</li> </ul>	RSO signatures are missing from Static and Scan     Survey data.	1) The Summary of Findings states "The K-S Test Flagged Pb-214, which was reported at higher concentrations than other survey units in Parcel B." A higher Pb-214 indicates elevated Ra-226 is present. The Data Eval Form does not state if the Pb 214 and Ra-226 results from the analysis were comparable. This information would provide insight into whether results in	location 081. No signature from the site RSO was recorded on this survey."  These statements are contradictory, stating the gamma static survey was approved on 3/6/08 but then stating the site RSO signature is missing.	
			2) Gamma static and scan surveyor is not listed in the SUPR  3) Names of samplers/surveyors not provided in SUPR	detect Ac-228 does not necesarily indicate falsification, it does indicate a lack of reliability of the data, which is equally problematic if the data is not deemed usable for the intended purpose of demonstrating compliance with the ROD.					collection dates do not follow the expected chronological order, this is evidence of falsification of data.  3) RSO signature missing from the Static Survey and Scan Survey.  4) The Data Evaluation Form states "The K-S Test Flagged Pb-214, which was reported at higher concentrations than other survey units in Parcel B." The reviewer notes that a higher Pb-214 indicates elevated Ra-226 is present. Further investigation will be needed	2) Sampler/Surveyor names are missing from the SUPR.	TU017 were falsified or not.	2) The Summary of Findings states "The K-S Test Flagged Pb-214, which was reported at higher concentrations than other survey units in Parcel B." A higher Pb-214 indicates elevated Ra-226 is present. The Data Eval Form does not state if the Pb-214 and Ra-226 results from the analysis were comparable. This	
									to identify what value of Ra-226 was reported by the lab compared to the elevated Pb-214 result in order to determine if this is an indication fo data falsification or a data quality issue.			information would provide insight into whether results in TU017 were falsified or not. Can the Navy provide this information?  2) Where is the missing data and why 1) The Data Evaluation Form Summary of	
			1) Gamma static survey was performed on 12/21/2006 prior to the collection of the FSS samples. The static survey was approved on 5/12/2007." "No signature from the site RSO was recorded on this survey."					c	1) The Data Evaluation Form Summary of Findings states "The K-S test flagged Pb-214, Ac-228, and Pb-121. These radionuclides, plus Bi-214 and Bi-212, presented higher-than-average results in TU018 compared to the rest of Parcel B. High results are not considered to be evidence of potenetial data falsification." The reviewer notes, however, that elevated concentrations of Bi-214 and Pb-214 indicate the presence of elevated Ra-			Findings states "The K-S test flagged Pb- 214, Ac-228, and Pb-121. These radionuclides, plus Bi-214 and Bi-212, presented higher-than-average results in TU018 compared to the rest of Parcel B. High results are not considered to be evidence of potenetial data falsification." The reviewer notes,	
TU018 1	Cs-137 results all low, with multiple negative results - indicating a data quality issue	2	2) Names of samplers not provided in SUPR.  The reason the Gamma Static Survey was conducted in December 2006 but not approved until May 2007 has not been discussed in the Data Evaluation Form. In addition, the Data Eval Form states the static survey was approved, but also states the site RSO signature is missing. It is unclear what personnel approved the survey data and whether such staff was qualified to approve radiological data in lieu of the RSO. The lack of the RSO signature is		1	R. Roberson	Name(s) not provided		<ul> <li>226, but the Data Evaluation Form does not state if comparable Ra-226 results were reported and if so, if these levels exceeded the release criteria. Elevated levels of Bi-212 and Ac-228 indicate elevated concentrations of Th-232, however the Data Evaluation Form has not stated if this is the case or if the data are deemed to be anomolous.  Further investigation by the Navy is needed.</li> <li>2) The Data Evaluation Form Logic Test 4 provides FSS analysis dates, as follows: FSS samples 048 through 052, 054, 055, 056 through 062, 064, and 065 were analyzed on</li> </ul>	1) Site RSO signature missing from Gamma Static and Scan data in the SUPR.		however, that elevated concentrations of Bi-214 and Pb-214 indicate the presence of elevated Ra-226, but the Data Evaluation Form does not state if comparable Ra-226 results were reported and if so, if these levels exceeded the release criteria. Elevated levels of Bi-212 and Ac-228 indicate	0
			suspicious.						1/7/2007. FSS sample 053 was analyzed on 9/22/2010, Fss sample 063 was analyzed on 1/4/2007. No explanation is provided as to why sample 053 was analyzed over three years after the other samples.			elevated concentrations of Th-232, however the Data Evaluation Form has not stated if this is the case or if the data are deemed to be anomolous. Further investigation by the Navy is needed.	
			1) Gamma static and scan date and time not provided in the SUPR						1) Unusually narrow range of Gamma Static Data.  2) Suspect Worker involved with data collection for this TU020.  3) Sampler name missing from SUPR.	Gamma static and scan results were not provided in			
TU019 2	Cs-137 results all low, with multiple negative results - indicating a data quality issue quality issue quality issues.		2) Gamma scan survey was performed on 9/29/06 at 1013, during FSS sample collection. Collection of scan data at the same time that FSS samples are collected is supicious because the MARSSIM approach requires sthe gamma scan data be collected to inform the development of a sufficiently robust FSS survey design.		0	Name(s) not provided	P. Vigil		4) The sewer line was connected to a radiologically-impacted building, Bldg. 103.  5) Bi-214, K-40, Bi-212, all had the 3rd lowest results of all the Tys in Parcels B & D-2. In addition, Pb-214 mean results is the lowest of all TYs in Parcels B & D-2. The Data Evaluation Form argues that adjacent TU012 also had abnormally low mean concentrations in an area where the two TUs adjoin and therefore may rpepresent a difffernt soil type is represented rather than an indication of falsification. The reviewer acknowledges this may be the case but with the existing data, and the extensive data	the SUPR  2) Gamma static and scan surveyor is not listed in the SUPR			0
			1) Gamma static and scan date and time not provided in the SUPR  2) Gamma Static Survey data ranged between 5,583 and 6,708 cpm. The Data Evaluation	The Data Evaluation Form states "[N]o					quality issues highlighted in data throiughout Parcel B, sufficient information does not exist to determine the reason for the low values. The reviewer also notes that it is also possible the unusually low mean values for this data may be due to falsification.  1) Gamma static and scan date and time not provided in the SUPR  2) Gamma Static Survey data ranged between 5,583 and 6,708 cpm. The Data Evaluation	Gamma static and scan date and time not provided in		The Data Evaluation Form states "[N]o	
TU020 2	Cs-137 results all low, with multiple negative results - indicating a data quality issue  Ac-228, K-40, and Cs-137 data include negative values, indicating quality issues in the analysis	g data 1	Form states this range is consistent with the gamma scan data; however the scna survey data ranged from 4.200 and 7,100 cpm. Therefore, the Static data is not consistent with the scar data since the range for the static surveys is very small compared to the scan data and what would be expected for environmental surveys of land areas.	between onsite and offsite data." The between onsite and offsite data."	0	Name(s) not provided	P. Vigil	d	Form states this range is consistent with the gamma scan data; however the scan survey data ranged from 4.200 and 7,100 cpm. Therefore, the Static data is not consistent with the scan data since the range for the static surveys is very small compared to the scan data and what would be expected for environmental surveys of land areas.  3) Suspect worker involved in data collection at TU020.  1) Gamma static and scan date and time not provided in the SUPR	SUPR.		direct comparison could be made between onsite and offsite data." The reviewer requests the Navy provide clarification regarding this statement.	0
				For the FSS sample 06, the onsite/offsite K-40 results differ by more than a factor of					2) Gamma Static Survey data ranged between 5,728 and 6,427 cpm. In contrast to the Data Evaluation Form for TU0020, the Data Evaluation Form for this TU 0021 states this range iis an unusually narrow range for heterogeneous soil but is consistent with the gamma scan range and the FSS dataset. Scan survey data ranged from 5.200 and 6,800 cpm. The reviewer notes that the Static and Scan data have too narrow of a range and therefore is suspect for falsification.	No bias or confirmatory samples were collected.	1) TU0021 contained the sewer line that was connected to or downstrean from the radiologically-impacted Building 103.	Section II, Item 2 of the Data Evaluation Form states "Final Systematic smaples from this TU contain low mean concentrations of Bi-214, K-40, Pb-212,	
TU021 2	Cs-137 results all low, with multiple negative results - indicating a data quality issue  Ac-228 and K-40 data sets incl negative values. May indicate data issues.		1) Gamma static and scan date and timenot provided in the SUPR  2) Gamma static and scan range of data values too narrow for measurement of heterogeneous environmental land areas.	10x (7.796 vs. 0.707). Other data compares satisfactorily. The reviewer notes that having radionuclides of concern have comparable values between onsite and offsite data, but very differnt K-40 results has been proven in the past to be an indication of data falsification and is highly suspect for this TU021.	1	A. Jahr	Name(s) not provided		3) Suspect worker involved in data collection at TU021.  4) For the FSS sample 06, the onsite/offsite K-40 results differ by more than a factor of 10x (7.796 vs. 0.707). Other data compares satisfactorily. The reviewer notes that having radionuclides of concern have comparable values between onsite and offsite data, but very differnt K-40 results has been proven in the past to be an indication of data falsification and is highly suspect for this TU021.	2) Numerous discrepancies noted in the data (i.e., unusually low values and data ranges, negative Ra-226 values), discrepancies in K-40 results between onsite and offsite labs, yet no other sampling was conduted to confirm conditions at TU021.	<ul> <li>2) Section II, Item 2 of the Data Evaluation Form states "Final Systematic smaples from this TU contain low mean concentrations of Bi-214, K-40, Pb-212, and Pb-214 compared to other TUs in Parcels B &amp; D02. In addition, the fact that TU020 and TU021 were sampled on the same day likely resulted in the disparity between Units and Days flags.</li> <li>3) Section II, item 2 of the Data Evaluation Form states that a review of the Ra-226 data shows that the Ra-226 concentration in several samples have large negative values and are "apparently statistically indistinguishable from teh remediation action level." The reviewer notes that large negative values of the Ra-26 data indicates a data quality issue and therefore such data in not reliable for decision making/demonstrating the ROD criteria has been met.</li> </ul>	and Pb-214 compared to other TUs in Parcels B & D02. In addition, the fact that TU020 and TU021 were sampled on the same day likely resulted in the disparity between Units and Days flags.  Reviewer requests further clarification of the statements and where information about a disparity between	0
				Data Evaluation Form states "Data					5) Section II, Item 2 of the Data Evaluation Form states "Final Systematic smaples from this TU contain low mean concentrations of Bi-214, K-40, Pb-212, and Pb-214 compared to other TUs in Parcels B & D02. In addition, the fact that TU020 and TU021 were sampled on the same day likely resulted in the disparity between Units and Days flags.			units and days can be found.	
TU022 1  TU023 1  TU024 1  TU025 1  TU026 1  TU027 1	Cs-137 results all low, with multiple negative results - indicating a data quality issue  Ac-228 and K-40 data sets incl negative values, indicating data q issues.		None.	comparable with the following exception: 6PBFS-022-34 Pb-210 value (0.18 vs 4.0189 pCi/g).  2 Ac-228 FSS results below 0.	0	Name(s) not provided	P. Vigil	0		None.	As in all other TUs, significant data quality issues exist, making the data unreliable for decision making and in demonstrating compliance with the ROD release criteria.		0
TU027 1 TU028 1 TU029 1 TU030 1 TU033 1 TU036 1 TU037 1 TU039 1													
TU041 1 TU042 1 TU043 1 TU044 1 TU045 1 TU046 1 TU047 1 TU048 1													
TU049 1	1. FSS_Bias line has different slope 228 and Bi-214. 1. K-40, Cs-137 FSS_SYS have low variability. 2. Form notes, "The quantile pl	ots 13	1. For gamma static data, form notes, "Static survey date and time not provided in SUPR. Gamma static dataset inconsistent (low variability) with scan data and Final Systematic sample dataset with results between 3,998 and 4,855 cpm. Mean result of 4,201 ±211 cpm.  2. For gamma scan, form notes, "Gamma scan range is 4,350 – 14,200 cpm, with the investigation level at 7,100 cpm. Gamma scan dataset is not consistent with static data or Final Systematic sample dataset."	1. Form notes, "Eight samples were counted by offsite labs for confirmation.  1. For Bi-214 Form notes, "Final Systematic samples #482, 483, 484, and 486 have abnormally low results."		Name not provided	C Hughes		1. Form notes: "Gamma static dataset inconsistent (low variability) with scan data and Final Systematic sample dataset with results between 3,998 and 4,855 cpm." Also, "Gamma scan dataset is not consistent with static data or Final Systematic sample dataset."  1. dataset."	SUPR did not have static survey date and time	1. Resample due to low variability gamma static data set that was inconsistent with scan data and the FSS data set and inconsistency between gamma scan and FSS data set. Also, low variability of B-214, AC-228, K-40 FSS_Bias samples suggest these are not related to the gamma scan data.	S	PCA run but did not identify any
TU050A 2	1. K-40 FSS_Bias samples line h different slope than the other plot data.  1. K-40, Cs-137 FSS_Bias have low variability, for K-40  2. Form notes for Ac-228, "The quantum data."	otted	<ol> <li>Form concludes that the "Final Systematic samples appear to have been properly collecte in the areas of highest gamma scan and hot spots weren't avoided." However, without GPS data how can this be certain and why weren't there FSS_Bias samples at the hot spots?</li> <li>For gamma static data, form notes, "Static survey date and time not provided in SUPR. Gamma static dataset inconsistent (low variability) with scan data and Final Systematic sample dataset with results between 3,903 and 4,310 cpm. Mean result of 4,074 ±115."</li> <li>For gamma scan, form notes, "Gamma scan range is 3,840 – 12,580 cpm, with the</li> </ol>	Systematic samples #483, 484, and 486 have abnormally low results."  1. RPD for 7 samples was 74.31.	0	Name not provided	C Hughes	1	Low variability for Bi-214, Ac-228, K-40 FSS_Bias samples      Gamma static dataset low variability and inconsistent with scan data and Final Systematic sample dataset with results between 3,903 and 4,310 cpm. Also, "Gamma 1	SUPR did not have static survey date and time	Resample due to low variability gamma static data set that was inconsistent with scan data and the FSS data set and		unusual patterns
	appears to be a different population  plot for Ac-228 indicates that muscle soil types may be present in the tunit."  1. For Ac-228 and Bi-214, FSS_SYS have low variability and 1. Ac-228 and Bi-214 FSS_SYS have	ultiple rench	investigation level at 7,100 cpm. Gamma scan dataset is not consistent with static data or Final Systematic sample dataset."  1. For gamma static data, form notes, "Static survey date and time not provided in SUPR. Gamma static data are consistent with scan data (both low variability) and inconsistent with  FSS sample dataset."	· • • • • • • • • • • • • • • • • • • •					scan dataset is not consistent with static data or Final Systematic sample dataset."  1. Gamma scan and gamma static data are inconsistent with each other and inconsistent with the FSS data.		1. After 23 rounds of excavation and sampling, the Ra-226 contaminated portion of the trench became a new trench unit, T 051A, but it is unclear if all of the Ra-226 contamination was in the area that became TU 051A from the beginning.  2. Form notes about dates FSS_SYS samples were collected, "FSS samples 6PBFS-051-334, -335, -337 through -340, -345 through -351 were collected on 02/18/2008. Samples -336, -341 through -344 were collected on 02/19/2008." Although	U	PCA run but did not
TU051 2	appear to be a different population.  slope suggesting different population.  1. For Bi-214, FSS_SYS set has he slope than all of the other set.	ation. 23	For gamma scan, form notes, "Gamma scan data is consistent with static dataset and inconsistent (low variability) with FSS sample dataset."  1. For gamma static data, form notes, "Static survey date and time not provided in SUPR.	average Ra-226 result reported by the offsite lab is 38.8% of the result reported by the onsite lab. "  1. Form notes for Ri-214, Ac-228, and	1	B Evans	Name not provided	1	inconsistent with the FSS data.  2. Collection of FSS_SYS samples on two days may be indication of falsification, particularly since one sample, 336, was collected out of order on the 2nd day.	SUPR did not have static survey date and time	the Form concludes this is not evidence of falsification, it could be, particularly, since sample 336 was collected out of sequence.  3. Resample due to inconsistent gamma scan and gamma static data, low variability gamma static data, evidence that there as different populations (low variability Ac-228 and Bi-214 FSS_SYS), and potential falsification associated with sampling over multiple days.  1. This TU was split from TU 051 after it underwent 23 rounds of excavation and sampling; 9 more round of excavation and		identify any unusual patterns  PCA run but did
TU051A 2	<ol> <li>FSS_Bias samples appear to be a different population (low variability) for Ac-228, Bi-214, and K-40.</li> <li>Bi-214 FSS_SYS set has low variability and for K-40, FSS_SYS has higher mean and lower variability.</li> <li>FSS_SYS for Bi-214 has somewhat lower variability than</li> </ol>	ore ability) 9 aples	Gamma static dataset inconsistent (low variability) with scan data and FSS sample dataset."  2. For gamma scan, for notes, "Gamma scan data is consistent with FSS sample dataset and inconsistent with static data. Scan range for the 2350-1 Instrument is 2,890 – 13,200 cpm, sigma investigation level for the 2350-1 Instrument is 7,048 cpm."	offsite analysis Pa-226 results are lower indicate the notential for at least two	0	Name not provided	C Hughes	1	<ol> <li>Gamma static and gamma scan data are consistent with each other, but inconsistent with the FSS_SYS data.</li> <li>Collection of a single FSS_SYS sample 2 days after collection of the others.</li> </ol>	SUPR did not have static survey date and time	sampling conducted on TU 051A (for a total of 32).  2. One FSS_SYS sample collected 2 days after the others.  3. Resample due to inconsistent gamma scan/static data with FSS data set, low variability Bi-214, Ac-228, and K-40 FSS samples, and collection of one FSS_SYS sample 2 days after collection of the others - possible substitution.		not identify any unusual patterns
TU052 0	<ol> <li>FSS_SYS for Bi-214 has somewhat lower variability than other data sets.</li> <li>FSS_Bias samples for Ac-228, Bi-214, and K-40 have low variability and higher means that the other sample sets; K-40 appears to be a different population.         <ol> <li>FSS_SYS for Bi-214 have low variability.</li> </ol> </li> </ol>	for K- 4	Scan and static surveys consistent. Range of statics, 4,400 to 5,500 cpm.	comparison to Ac-228. The offsite lab reported two final systematic samples (051 and 065) at 0."  1. Form notes, "Data is inconsistent. Samples 117 and 120 Ac-228 concentrations were not detected at the offsite lab after yielding results above the detection limit for the onsite lab."  1. Form notes for Ac-228, Bi-214, and K-40: ": Bias and characterization samples indicate the potential for at least two data populations."	0	Name not provided  Name not provided	C. Fluty P. Vigil	0	0	No signature from RSO for gamma survey and scans	<ol> <li>Appears off-site lab had trouble with Ac-228 analysis.</li> <li>Resample due to low variability of FSS_SYS and FSS_Bias for Bi-214, apparent different population for K-40 FSS_Bias, and inconsistent off-site lab results.</li> </ol>		0
TU054 2	<ol> <li>FSS_SYS for Bi-214 and K-40 have somewhat lower variability than other data sets.</li> <li>FSS_SYS for Ac-228 and Bi-214 and FSS_Bias for Bi-214 and Cs-137 have low variability.</li> <li>Form notes, "Sample distribution of final systematic is to be different populations."</li> </ol>	appear 4	<ol> <li>Scan and static data sets consistent, scan noted to be on the high side of the gamma scal range. Also consistent with FSS samples.</li> <li>Static maximum (6,889 cpm) inconsistent with gamma scan maximum (14,620 cpm). No signature from RSO.</li> </ol>	1. 1 out of 7 off-site lab samples had inconsistent weight with the on-site lab samples  1. Form notes that "Data comparison is relatively consistent for Ac-228, Bi-214,	1		Name not provided  Name not provided	1 1	1. One sample sent to the off-site lab had a different weight than the sample counted by the off-site lab; suggests a different sample may have been sent.   1  Static max is less than 1/2 of the gamma scan max.  1	<ol> <li>No date or time for gamma statics in SUPR.</li> <li>No RSO signature for gamma scans or survey.</li> </ol>	<ol> <li>1. 1 out of 7 off-site lab samples had inconsistent weight with the on-site lab samples, which may be an indication of falsification.</li> <li>2. Resample due to inconsistent weight of one off-site lab sample, low variability FSS_SYS for Bi-214 and K-40, apparent different population of K-40 characterization samples.</li> <li>1. Resample due to low variability of FSS_SYS for Ac-228 and Bi-214 and FSS_Bias for Bi-214 and Cs-137 and inconsistent gamma statics.</li> </ol>		0
	to be different populations  1. K-40 characterization samples have low variability and FSS_Bias samples have lower mean and variability than FSS_SYS samples. May indicate multiple sources.  1. For K-40, FSS_Sys and FSS_Bias to be different populations	appear 5	signature from RSO.	and K-40."  1. Form notes, "Data is inconsistent in comparison to Ac-228, K-40, and Bi-214. Two Ac-228 results were reported at zero by the offsite lab."	0	Name not provided	P. Vigil	0	1	No RSO signature for gamma scans or survey.	gamma statics.  1. Resample due to low variability and inconsistent K-40 samples, inconsistent off-site lab results.		EPA Statistician performed more detailed statistical analysis included separately
TU058 2	FSS_SYS and FSS_Bias for Bi-214 have low variability.  1. Appears to be 2 populations for FSS_SYS  FSS_SYS	2 2	Form notes, "The scan data is consistent with the gamma static dataset. The gamma scan and static data do not reflect the range of results from the laboratory data."	1. Form notes, "Data is inconsistent in comparison to Ac-228, Bi-214 and K-40. Two FSS samples (57 and 63) have results at 0 based on the offsite data."  1. Form notes, "The sample mass was inconsistent for sample 092. The onsite lab reported 366 grams while the offsite	0	Name not provided	P. Vigil	1	Gamma scan and gamma static data are inconsistent with the FSS laboratory data.  1	1. No RSO signature for gamma scans or survey.	Resample due to gamma scan and static data inconsistency with FSS lab data, multiple populations for K-40, and low variability Bi-214 FSS data.		0
TU060 2	1. FSS_SYS for Bi-214 has very low variability.	3	1. Gamma static max about 650 cpm lower than gamma scan max.	lab reported 296 grams."  2. FSS Samples counted by off-site lab over a year later.  3. Form notes, "Data is inconsistent in comparison to Ac-228. Two FSS samples (092 and 109) have results at zero based on the offsite data.  The offsite data Vs onsite data is inconsistent in comparison to Ac-228	1	R. Roberson	Name not provided	1	<ol> <li>On- and off-site weights for sample 92 were different, suggesting possible sample substitution.</li> <li>Form notes inconsistent results between off-site and on-site lab for multiple radionuclides.</li> </ol>	1. No RSO signature for gamma scans or survey.	<ol> <li>Resample due to different weights for on- and off-site lab and counting of samples at off-site lab over a year later, suggesting possible sample substitution; inconsistent results between off-site and on-site lab; and low variability in Bi-214 FSS_SYS data set.</li> </ol>		0
TU061 2	1. K-40 FSS_SYS and FSS_Bias h 1. FSS_Bias samples for Bi-214 and K-40 have lower variability than FSS_SYS samples.  1. K-40 FSS_SYS and FSS_Bias h different slopes, FSS_SYS has mu populations. 2. Form notes, FSS: Bimodal distribution indicate	ltiple "K-40	Gamma static max is about 1000 cpm lower than gamma scan max.	Form notes, "Biased samples were all taken 'along the trench bottom.' The FSS samples, taken over the entire SU, show a broader range of activity, as expected. K-40 activity in the trench bottom was unusually homogeneous."	1	R. Zahensky	Name not provided	1	1. FSS_SYS Samples collected over two days. K-40 has much higher variability and Cs- 137 has a much lower variability for samples collected the second day, suggesting different population. Bi-214 samples collected the first day have a lower mean and lower variability than those collected the second day.	No reviewer or report data for gamma statics.	Resample due to uncertainty. FSS_SYS samples collected on two days but show significantly different results, suggesting different populations. FSS_Bias samples for K-40 and Bi-214 have lower variability than FSS_SYS. Also, gamma static max is bit low.	s a	EPA Statistician performed more detailed statistical analysis included separately
TU062 0 TU063 0	1. K-40 FSS_SYS (no bias samples slope breaks indicating multip populations.  1. FSS_Bias samples have lower variability than FSS_SYS samples for Ac-228, Bi-214, while the opposite is true for K-40 and Cs-137.  1. Slope breaks in FSS_SYS for Ac-2 214, K-40, indicating multiple populations.	28, Bi-	Gamma static (4655 - 6034 cpm) and Gamma survey (4700 to 6100 cpm) ranges are unusually consistent	1. Form notes, "Data is inconsistent in	1	J. Taylor J. Taylor	Name not provided  Name not provided	0	1	No reviewer or report data for gamma statics.  1. No RSO signature for gamma scans or survey.	Multiple populations do not necessarily indicate falsification.		0
TU064 0	1. FSS_SYS samples have lower variability than other sets for Ac-228, Bi-214, K-40, and Cs-137 and Ac-228.	r K-40 2	1. Gamma static max about 600 cpm lower than gamma survey max.	<ol> <li>Form notes, "Data is inconsistent in comparison to Ac-228 and K-40. Two final systematic samples (064 and 069) have results at zero based on the offsite data. Two final systematic samples (064 and 069) have low K-40 activity based on the offsite data."</li> <li>Form notes, "Two samples were sent to</li> </ol>	0	Name not provided	C. Fluty				1. DON had one sample recounted as part of a quality review.		0
TU065 2	FSS_SYS Bi-214 samples have low variability  1. Multiple populations of Ac-228 214	and Bi	<ol> <li>Form notes about gamma statics: "Static survey date and time not provided in SUPR. Gamma static dataset reported low variability and the range of results was inconsistent with the gamma scan dataset."</li> <li>Form notes about gamma scan: "Gamma scan dataset reported a range of results between 3,200 cpm and 5,400 cpm with an investigation level of 9,321 cpm, and was inconsistent with the gamma static dataset."</li> </ol>	the offsite lab for analysis, and one of these samples was sent to two different offsite labs for analysis. The Ac-228 results reported by the onsite lab were not consistent with the results reported	1	R. Roberson	Name not provided	1	Gamma scan and gamma statics were inconsistent with each other. Gamma statics had low variability.  1	SUPR did not have static survey date and time	1. Resample due to inconsistent gamma scan and gamma statics, low variability Bi-214 FSS_SYS.		0
TU125 2	1. FSS_SYS and FSS_Bias have low variability for Ac-228 and Bi-214. FSS_SYS have low variability for K-40, but FSS_Bias have higher mean and variability. FSS_Bias have low variability for Cs-137.  1. K-40 FSS_Bias appear to be a direction. There is a slope bre population. There is a slope bre populations) in the FSS_SYS for k  1. K-40 FSS_SYS and FSS_Bias have populations in the FSS_SYS for k  1. K-40 FSS_SYS and FSS_Bias have populations in the FSS_SYS and FSS_Bias have different slopes, and slope bre indicative of multiple populations.	ak (2 5 (-40. ave aks	1. No date or time recorded for the static survey in SUPR.  2. Form notes for gamma scan, "Scan survey performed on 04/09/09 at 11:20 after the first final systematic sample was collected." However, the gamma scan should have been performed first, followed by the gamma statics.	t 1. RPD 53.28 to 125.37 for Ra-226.  1. One bias sample below zero for Bi-214.	1	R. Zahensky	Name not provided	1	Gamma scan conducted after or during collection of FSS_SYS samples.  1 Nearly identical gamma scan and gamma static data ranges.	SUPR did not have static survey date and time	<ol> <li>Resample due to apparent different populations of K-40 between FSS_SYS and FSS_Bias, low variability of Ac-228 and Bi-214 FSS_SYS and FSS_Bias.</li> <li>Multiple flags for K-S test (compared to results from B and D-2). Ac-228 mean 7th lowest. K-40 mean 7th highest. Bi-21</li> </ol>	2	1
TU126 2	228 and Bi-214. FSS_SYS has low variability for K-40 and FSS_Bias has very low variability for Cs-137. Mean of K-40 Appears to indicate that samples be from different locations, possil associated with TU 126.	ons. 4 could oly not	<ol> <li>Gamma static (3715-7401 cpm) and gamma scan (3,700 to 7,400 cpm) ranges were unusually consistent (nearly identical). This consistency is suspect.</li> <li>Form notes about gamma statics, "Gamma static counts ranged between 6,758 and 11,311 cpm; four counts exceeded the IL of 9,160 cpm. The range of gamma static counts is consistent with the gamma scan range and the FSS dataset. No reviewer or review data listed.</li> </ol>	S  1. Form notes, "Onsite / offsite data  compared satisfactorily within one order	1	T. Rolfe	Name not provided	1	Nearly identical gamma scan and gamma static data ranges.      K-40 data appear to indicate different sources for FSS_SYS and FSS_Bias samples.      Unusually consistent gamma scan and gamma static data ranges.	No reviewer or review date for gamma statics.	mean is 7th lowest. Pb-212 is 12th lowest.  2. Resample due to unusually consistent gamma static and gamma scan data, low variability FSS_SYS and FSS_Bias for Ac-22 and Bi-214 and K-40 FSS_SYS, and the potential that the K-40 sample indicate different sources.		0
TU127 2	No FSS_Bias samples, even though there were gamma static and gamma scan exceedences.  1. Slope breaks in FSS_SYS for Ac-2 214, K-40, indicating multiple populations.  1. FSS_SYS and SYS_1 appear to	e 2	consistent with the gamma scan range and the FSS dataset. No reviewer or review data listed.  2. Form notes about gamma scan, "The gamma scan range was reported between 6,250 and 11,800 cpm, which is consistent with the range of gamma static counts and the FSS dataset No further explanation is given for additional actions taken as a result of exceeding the IL of 9,160 cpm. These results are unusual in that the scan range and the static range are nearly identical."  1. Form notes about gamma statics, "No date or time recorded for static survey in SUPR. Gamma static dataset consistent with scan data (on the higher end of the scan range) and	compared satisfactorily within one order of magnitude (a factor of 10)." Language suggests that there could have been large differences.	1	A. Smith	Name not provided	1	<ol> <li>Possible factor of 8 or 9 difference between on-site and off-site lab results.</li> <li>No FSS_Bias samples even though there were exceedences in the gamma scan and gamma static data.</li> </ol>	No reviewer or review date for gamma statics.	Resample due to unusually consistent gamma scan and gamma static data ranges, failure to collect bias samples when there were gamma scan and gamma static exceedences, multiple populations in FSS_SYS data for Ac-228, Bi-214, K-40.		0
	1. Characterization samples appear to be a different population for Bi-214 and K-40 due to very low variability, possibly Ac-228 due to lower mean and data range.  1. FSS_Bias has low variability for Ac-228, Bi-214, and K-40: K-40 also has lower mean than ESS_SYS_ESS_SYS_has	slopes, K-40 3	FSS dataset."  2. Form notes about Gamma scan, "Gamma scan exceeded the scan threshold, but SUPR doesn't reference the count rate exceedances."  1. Form notes about gamma statics, "Static survey date and time not provided in SUPR. Gamma static measurements ranged between 2,452 and 6,581 cpm and are consistent with the reported gamma scan range and FSS dataset."	1. RPD 25.05 5o 114.16  1. Form notes, "Onsite / offsite data compared satisfactorily within one order	1		Name not provided	1	Samples appear to be from different sources (data sets have different slopes and slope breaks)  1. Possible failure to collect gamma scan after final excavation and before FSS_SYS samples were collected.	SUPR did not have static survey date and time  1. SUPR did not have static survey date and time.	<ol> <li>Resample due to different sample sources, based on K-40 and Ac-228 Q-Q plots.</li> <li>Resample due to different sources as indicated by the Bi-214, K-40, and Ac-228 data, possible large differences between</li> </ol>		EPA Statistician performed more detailed statistical
TU131 2	1. FSS_Bias has low variability for Ac-228 and Bi-214 and characterization samples had low variability for B-214 and K-40  1. FSS_Bias has low variability for Ac-228 and Bi-214 and characterization samples had low variability for B-214 and K-40  1. FSS_SYS, FSS_Bias, characterization samples had low variability for B-214 and K-40  1. FSS_SYS, FSS_Bias, characterization samples had low variability for B-214 and Characterization samples had low variab	e break 2  ation, for K- SS_SYS 3	2. Form notes about gamma scan, "The scan survey was performed on 05/08/09 at 12:25; however, this date may be a reporting error since it is more likely the survey date would have been 05/28/09. Gamma scan range listed as 2,020 to 7,020 cpm – less than the IL of 9,160 cpm. Gamma scan range is consistent with the gamma static measurements range and FSS dataset."	of magnitude (a factor of 10)." Language suggests that there could have been large	0	R. Zahensky  Name not provided	Name not provided  J. Walther	1	<ol> <li>Possible factor of 8 or 9 difference between on-site and off-site lab results.</li> <li>Data indicate different sources (populations) for Bi-214, K-40 and Ac-228.</li> <li>Four samples analyzed by on-site lab 8 days after the other 14 samples were analyzed, which could indicate sample substitution.</li> <li>Different slopes for each K-40 data set indicates different populations, suggesting</li> </ol>	2. Gamma scan may not have been conducted after fina excavation.  No sampler name.	<ol> <li>Resample due to different sources as indicated by the Bi-214, K-40, and Ac-228 data, possible large differences between on- and off-site lab data, and potential failure to collect gamma scan data after final excavation.</li> <li>Form notes about sample analysis, "Samples 55-58, 60, 62-64, 66, and 68-72 were analyzed on 11/10/10. Samples 59, 6 65, and 67 were analyzed on 11/18/2010." This is suspicious - there may have been sample substitution for the 4 samples analyzed more than a week later.</li> <li>Resample due to notential sample substitution of 4 samples in ESS. SYS set and probable different sample source for</li> </ol>	1,	more detailed statistical analysis included separately  EPA Statistician performed more detailed statistical analysis included  0
	K-40.  K-40.  K-40.  40. There are slope breaks in the F data set indicating multiple popula	_							2. Different slopes for each K-40 data set indicates different populations, suggesting different sample sources.		2. Resample due to potential sample substitution of 4 samples in FSS_SYS set and probable different sample source for FSS_SYS, FSS_Bias, SYS_1, and characterization samples based on K-40 Q-Q plots.		analysis included separately

## Summary of EPA review of Parcel B Trench Units - Interim Draft 10-27-2017

Number of TU's	% of Parcel B total				
70	100%	Total trench units in Parcel B			
Navy reviewed 70 total Trench Units to look for signs of potential falsification					
2	3%	Navy recommended confirmation sampling due to signs of potential falsification			
2	3%	Navy recommended reanalysis of archived samples			
66	94%	Navy recommended NFA = No further action due to signs of falsification, but potential further action due to uncertainty			
EPA reviewed the 66	Trench Units recommende	d for NFA			
4	6%	EPA score 0 = No specific findings of particular concern			
3	4%	EPA Score 1 = Need further review			
37	53%	EPA Score 2 = Need resampling before determination that the record supports ROD requirements met			
22	33%	Not yet reviewed			
Total Navy and EPA recommend for resampling					
39	56%				

Trench Unit		
TU062 TU063 TU064 TU064 TU015 TU018 TU018 TU022 TU023 TU024 TU025 TU026 TU026 TU027 TU028 TU029 TU029 TU030 TU030 TU033 TU033 TU036 TU037 TU039 TU040 TU041 TU041 TU042 TU042 TU044 TU045 TU044 TU045 TU046 TU047 TU048 TU049 TU040 TU040 TU041 TU041 TU042 TU043 TU044 TU045 TU046 TU047 TU048 TU049 TU049 TU040 TU001 TU001 TU001 TU001 TU001 TU002 TU003 TU004 TU004 TU004 TU005 TU006 TU007 TU008 TU009	Trench Unit	Overall score (0, 1, or 2)
TU063 TU064 TU015 TU015 TU015 TU018 TU022 TU023 TU024 TU025 TU026 TU027 TU028 TU028 TU029 TU029 TU030 TU033 TU033 TU033 TU039 TU039 TU039 TU040 TU041 TU041 TU041 TU042 TU043 TU044 TU044 TU045 TU046 TU047 TU048 TU048 TU049 TU040 TU050 TU006 TU007 TU008 TU009 TU009 TU009 TU010 TU011 TU012 TU011 TU011 TU019 TU010 TU010 TU010 TU011		
TU064 TU015 TU018 TU018 TU018 TU022 TU023 TU024 TU025 TU025 TU026 TU027 TU028 TU029 TU030 TU030 TU030 TU030 TU030 TU030 TU030 TU031 TU040 TU041 TU041 TU041 TU042 TU043 TU044 TU045 TU046 TU047 TU048 TU049 TU001 TU002 TU003 TU004 TU005 TU006 TU007 TU008 TU009 TU009 TU009 TU001 TU001 TU001 TU001 TU002 TU003 TU004 TU005 TU006 TU007 TU009		
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TU007 TU008 TU009 TU010 TU010 TU011 TU012 TU013 TU014 TU016 TU017 TU019 TU020 TU020 TU050 TU051A TU053 TU054 TU055 TU056 TU058 TU058 TU060 TU060 TU060 TU060 TU065 TU065 TU065 TU065 TU066 TU067 TU068		
TU008     TU009     TU010     TU011     TU012     TU013     TU014     TU016     TU019     TU020     TU021     TU050     TU051A     TU054     TU058     TU058     TU058     TU056     TU058     TU065     TU065     TU065     TU065     TU060     TU065     TU066     TU066     TU067     TU067     TU068     TU058     TU060     TU060     TU061     TU065     TU065     TU066     TU066     TU067     TU067     TU068     TU068     TU069     TU069     TU060     TU060     TU061     TU065     TU065     TU066     TU066     TU067     TU067     TU068     TU068     TU068     TU069     TU069     TU069     TU069     TU0127     TU128     TU128     TU128     TU128		
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